rotund to orbicular, subcordate at the bases, truncate at apices, canescent, lateral leaflets subsessile, terminal petiolule 2–8 mm. long; peduncles 3–5 cm. long, strigose; spikes subcapitate, few-flowered; bracts 1.5 mm. long, rotund, truncate, sparsely hirsute, ciliolate; calyx canescent, 5 mm. long, slightly gibbous on the upper side, calyx lobes subequal, lanceolate, scarcely as long as the tube; corolla purplish, 6 mm. long; pod canescent, 1 cm. long, the body ovoid, 5 mm. long, the beak curved, about 5 mm. long.

Type. Katherine, Texas, March 22, 1907, *W. L. Bray* and *H. H. York 5,* University of Texas Herbarium.

An additional collection, Ottine, Gonzales County, Texas, April 11, 1926, *E. R. Bogusch 1284,* University of Texas Herbarium, has been examined.

This species most closely resembles *P. Sonorae* Rydb. from which it differs markedly in shape of leaf, pubescence, and fruit. Its nearest relative in Texas is *P. rhombifolia* (T. and G.) Rydb., from which is differs in being densely strigose, in having ovate-truncate leaflets and deltoid stipules, in having broadly ovate bracts and fewer flowers more densely arranged in the inflorescence.

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NOTES ON THE FLORA OF THE CHARLESTON MOUNTAINS, CLARK COUNTY, NEVADA. VI[1]

Ira W. Clokey

In the course of preparing the manuscript for the flora of the Charleston Mountains of Nevada, it has been found necessary to describe a new violet from the region and to make adjustments in the nomenclature of some of the species of several other genera. I am indebted to Mr. Milo S. Baker and to Dr. Jens Clausen for their interpretations of the violets of this area.

Ephedra fasciculata A. Nelson var. **Clokeyi** (Cutler) comb. nov. *E. Clokeyi* Cutler, Ann. Mo. Bot. Gard. 26: 402. 1939.

The range of the variety is cocentric with that of the species. Morphologically the variety is too close to *E. fasciculata* to warrant specific distinction, the two differing from each other principally in the size and shape of the fruit.

Echeveria pulverulenta Nutt. subsp. **arizonica** (Rose) comb. nov. *Dudleya arizonica* Rose, Addisonia 8: 35. 1923. *Echeveria arizonica* (Rose) Kearney and Peebles, Jour. Wash. Acad. Sci.

[1] Previous notes in this series have appeared as follows: Madroño 4: 128–130. 1937; Bull. So. Calif. Acad. Sci. 37: 1–11. 1938; *ibid.* 38: 1–7. 1939; Madroño 6: 211–222. 1942; *ibid.* 7: 67–76. 1943.

29: 479. 1939, not *E. arizonica* Hort. ex Berger. 1930. *Dudleya pulverulenta* (Nutt.) Britton and Rose subsp. *arizonica* (Rose) Moran, Desert Pl. Life 15: 72. 1943.

Recent authors—Jepson, Kearney and Peebles, and Munz—do not consider *Dudleya* sufficiently separated from *Echeveria* to be recognized as a distinct genus. This is clearly presented by Jepson (Fl. Calif. 2: 111. 1936) who considers the California species as having close affinities with the Mexican species of *Echeveria.* As stated by Moran (*op. cit.,* p. 74) the subsp. *arizonica* is a reduced desert form of the species.

Representatives of the genus *Amelanchier* are abundant in the Charleston Mountains, in some places being the dominant shrubs. Locally they fall into what are usually considered three species, *A. utahensis, A. oreophila* and *A. Covillei* (*A. nitens*). Owing to the similarity of these three shrubs and the great abundance of intermediates, they are considered here as not worthy of being kept specifically distinct. The three entities can be distinguished as follows:

Shrub symmetrical; leaves acute or rounded at apex, upper surfaces shiny; fruit fleshy.	
Leaves pubescent; fruit purplish	1. *A. utahensis*
Leaves glabrous; fruit somewhat mealy, white or occasionally with a purple cheek	2. *A. utahensis* subsp. *Covillei*
Shrub not symmetrical; leaves ovate or obovate, rounded at apex, dull, pubescent; fruit very juicy, purple	3. *A. utahensis* subsp. *oreophila*

1. Amelanchier utahensis Koehne, Gatt. Pomac. in Wissen. Beil. Progr. Falk-Real. Berlin 95: 25, pl. 2. 1890. *A. alnifolia* Nutt. var. *utahensis* (Koehne) Jones, Proc. Calif. Acad. Sci., ser. 2, 5: 679. 1895.

Colorado to Oregon, south to New Mexico, Arizona, southern Nevada and southeastern California. Local habitat, Juniper and lower Pinyon belts, at elevations between 1400 and 2100 meters. Widely scattered and locally the dominant shrub. Harris Springs road, *Clokey 7543;* Kyle Canyon, *Alexander 535, Clokey 7541;* 4 to 5 miles below public camp grounds (Kyle Canyon), *Maguire 18086, 18087;* Mountain Springs, *Clokey* and *Anderson 7971;* canyon east of Mountain Springs, *Clokey 8564.* Flowers in April and May; fruits in June.

In some areas, as along the ridge branch of the Harris Springs road, most of the plants are intermediate between the species and the subsp. *Covillei,* while along the old road from Kyle Canyon to Deer Creek, the shrubs are nearly all intermediate between the species and the subsp. *oreophila.*

2. Amelanchier utahensis Koehne subsp. **Covillei** (Standley) comb. nov. *A. Covillei* Standley, Proc. Biol. Soc. Wash. 27: 198.

1914. *A. nitens* Tidestr. *ibid.* 36: 182. 1923. *A. alnifolia* Nutt. var. *Covillei* (Standley) Jepson, Man. Fl. Pl. Calif. 510. 1925.

Eastern Inyo and San Bernardino counties, California, through southern Nevada to northern Arizona. Local habitat, in the Juniper Belt, at elevations of about 1200 meters, in washes and on hillsides. Wilson's Ranch, *Clokey 8236, 8237, McVaugh 5966, Maguire 18045.* Blooms in April; fruits in May and early June.

The type locality of *A. Covillei* is Cottonwood Springs, Panamint Mountains, Inyo County, California; that of *A. nitens* is Wilson's Ranch, Charleston Mountains, Clark County.

3. Amelanchier utahensis Koehne subsp. **oreophila** (A. Nels.) comb. nov. *A. oreophila* A. Nels. Bot. Gaz. 40: 65. 1905.

Montana south to New Mexico, Arizona and southern California. Local habitat, on steep hillsides and canyon bottoms, associated with *Cercocarpus ledifolius, Pinus monophylla* and *P. ponderosa* var. *scopulorum,* at elevations between 2100 and 2300 meters. Kyle Canyon, *Clokey 7141, 7142.* Flowers in May; fruits in August.

Viola charlestonensis Baker and Clausen, sp. nov. Herba geophyta depressa, 10 cm. alta vel minus, rhizomate erecto vel ascendenti cum radice valida altaque; caulibus 1–8, 1/2–2/3 longitudinis subterraneis cum 1 vel 2 nodis subterraneis, supra cum floribus foliisque dense confertis; foliis crassis, cinereis supra cum venis albidis, infra purpurascentibus; caulibus foliis pedunculisque pilis brevibus complanatis adpressis retrorsis subvestitis; foliis radicalibus paucis, rotundatis, late ovatis, obtusis, basi truncatis vel paulum cuneatis, integris, 1.1–2.3 cm. latis, 1–2.5 cm. longis, petiolis 4–6 cm. longis; foliis caulinis angustioribus, ovatis, apice acutioribus, basi cuneatis, 6–20 mm. latis, 8–25 mm. longis; stipulis foliorum radicalium scariosis, adnatis, alas in parte subterranea petioli formantibus; stipulis foliorum caulinorum griseis, lanceolatis, integris, 1–2 mm. longis; bracteolis subulatis, integris, prope medium pedunculi, 1.5–2.5 mm. longis; floribus numerosis, omnino petaliferis, saepe infertilibus; sepalis lineari-lanceolatis, vix auriculatis, 3.5–4 mm. longis, incanis processibus brevibus, albis, adpressis piliformibus; corolla 12–17 mm. diametro, flava supra, manifeste fuscata in dorso petalorum superorum; petalis superioribus et lateralibus late obovatis, lateralibus clavate barbatis; petalo inferiore late spatulato, truncato, breviore quam lateralibus petalis, cum brevi calcare processibus piliformibus vestito per calcarem ad medium petali extendentibus, petalo et calcare 8–11 mm. longo; ovario et basi styli dense muriculata; stylo 2.1 mm. longo; orificio stigmatis terminato tubo in gemma, in aeta terminato labro minuto; capsula per magna, truncata, latitudine et longitudine aequali, dense puberulenta, facie circa 8 mm. diametro; seminibus nigris, circa 2.1 mm. latis, 3.4 mm. longis; caruncula laeve, vix perspicua.

A depressed geophyte, not more than 10 cm. high; rootstock erect or ascending with a strong and deep tap root and branches, supplemented by a few roots springing from the rootstock; stems one to eight, one-half to two-thirds subterranean, one to two nodes below the ground, densely crowded above with leaves and flowers; leaves thick, ashy above with whitish veins, purplish beneath with an almost complete layer of short, appressed and retrorse hairs on both sides of the leaves, as well as on petioles, stems, and peduncles; radical leaves few, rounded, broadly ovate with blunt tip, and a truncate or slightly cuneate base, entire, 1.1–2.3 cm. wide, 1–2.5 cm. long, on petioles 4–6 cm. long; cauline leaves narrower, ovate, mostly with somewhat sharper point and cuneate base, 6–20 mm. wide, 8–25 mm. long; stipules of radical leaves scarious, adnate, forming wings on the subterranean part of petiole, the minute limb near the ground surface; stipules of cauline leaves grayish, lanceolate, entire, 1–2 mm. long; bractlets subulate, entire, above or below the middle of the peduncle, 1.5–2.5 mm. long; flowers abundant, wholly petaliferous, mostly infertile; sepals linear-lanceolate, scarcely auricled, 3.5–4 mm. long, hoary with short, white, appressed, hair-like processes; corolla 12–17 mm. across, yellow on the face, but conspicuously darkened on the backs of upper petals, and faintly on the backs of lower petals; upper and lateral petals broadly obovate, lateral with clavate beards; lower petal broadly spatulate, truncate, shorter than lateral petals, with a short spur covered with hair-like processes extending along the spur to middle of petal, 8–11 mm. including spur; ovary and base of style densely muriculate; style 2.1 mm. long, form and bearding as in group; stigmatic orifice bounded in bud by a tube, in age by minute lip; stamen-sheath as in group; capsule unusually large, truncate, as wide as long, densely puberulent, ca. 8 mm. across each face; seeds black, ca. 2.1 mm. wide, 3.4 mm. long, weight of mature seeds unknown; caruncle smooth, scarcely evident, smallest in *Nuttallianae.*

Type. Forest Service camp no. 1, Charleston Mountains, Clark County, Nevada, *Clokey 7501.* The type specimen is deposited at Pomona College Herbarium, Claremont, California; isotypes are widely distributed.

This species is known to occur only in the Charleston Mountains at elevations from 7500 feet to 9500 feet and in Zion National Park, Utah.

Citation of specimens. Nevada. Charleston Mountains, Clark County: Forest Service camp no. 1, *Clokey 7502, Baker 8690;* Lee Canyon, 9000 feet, *Clokey 7504, Baker 8696;* Charleston Park, 8825 feet, *Clokey 7503;* yellow pine forest, 9500 feet, June 20, 1926, *Jaeger;* ridge, south side of Lee Canyon in limestone, 8600 feet, July 25, 1913, *Heller.* Utah. "Zion National Park near summit, north of Zion Canyon in yellow pine belt, May 13, 1936,"

Cottam 6996. Arizona. Jacob's Pool, *Jaeger.* (The fact that in a single season Jaeger collected *flowering plants* of the violet at 7500 feet in June in the Charleston Mountains and at 5000 feet elevation in July at the Arizona station leads one to suspect that the data given on the Arizona label is incorrect.)

This species appears to thrive best in the Charleston Mountains in partial shade in soil containing considerable humus on brushy north or east slopes where it is associated with *Juniperus, Cercocarpus,* scattered Rocky Mountain yellow pine and nut pine. Its poorest development is in the open pine forest in Lee Canyon. The limited distribution of this plant may be accounted for if it proves to be a "lime violet," since the Charleston Mountains seem to be composed largely of limestone. Apparently very few seeds of *V. charlestonensis* are matured; not more than one plant out of ten of those observed in June, 1937, had developed mature capsules. On one unusually vigorous plant there were twenty-three sterile flowers and only two seed pods.

Chromosome counts made from bud fixations of *V. charlestonensis* showed a diploid count of $n = 6$.

On the basis of the scarcity of this species and its limited distribution, it might be assumed that it represents a relic which is dying out because of its low reproduction rate. Also, because it apparently has no very close relatives in the genus, it may be assumed to be very old. Probably its closest living relative is *Viola purpurea* subsp. *integrifolia* Baker and Clausen, yet in the size of its seeds and in its subterranean stems it resembles *V. pedunculata* Torr. and Gray. *Viola charlestonensis* differs from the above-mentioned species in the following particulars:

(a) It is covered with very short, retrorse, appressed, white hairs; on the leaf veins these hairs are so dense that the veins appear as white lines on the upper surfaces of the leaves.

(b) It is the only species in the *Nuttallianae* with wholly entire leaf margins; in *V. purpurea* subsp. *integrifolia* most of the later leaves are entire.

(c) It is the only species in the *Nuttallianae* with the spur pubescent on the exterior.

(d) The capsules and seeds are larger than those of *V. purpurea,* but they are comparable in size to those of *V. pedunculata,* which, however, is a much larger plant.

(e) The caruncle is very small and smooth; in all other species of the *Nuttallianae* it is rough and even wrinkled and it spreads out from the base of the funiculus in all directions.

Pedicularis semibarbata Gray subsp. **charlestonensis** (Pennell and Clokey) comb. nov. *P. semibarbata* Gray var. *charlestonensis* Pennell and Clokey in Clokey, Bull. So. Calif. Acad. Sci. 38: 6. 1939.

Typical *P. semibarbata* is a variable species of the high moun-

tains of southern California. The subsp. *charlestonensis* is confined to the Charleston Mountains and the Sheep Range, both of Clark County, Nevada. Owing to the distinct geographical range as well as to the morphological differences, this entity should be considered a subspecies rather than a variety.

Castilleja linariaefolia Benth. var. **omnipubescens** (Pennell) comb. nov. *C. linariaefolia* Benth. forma *omnipubescens* Pennell, Proc. Acad. Nat. Sci. Phila. 89: 424. 1938.

As var. *omnipubescens* is confined to the southern part of the range of *C. linariaefolia* and in some areas is the only form found, it is considered worthy of varietal rank.

South Pasadena, California.

A NEW PINE FROM MOUNT ROSE, NEVADA

Herbert L. Mason and W. Palmer Stockwell

In September of 1938 an unusual pine was observed growing on the east slopes of Mount Rose in Washoe County, Nevada. In general aspect this pine appears to be like its forest associate, *Pinus Jeffreyi* Murray, its most obvious difference being its diminutive cones. Closer examination, careful analyses, and preliminary breeding experiments, however, disclose a number of very important differences in structure, biochemistry and behavior that may serve to separate these two pines. A discussion of these differences and of the interrelationships of the new pine with other members of the genus must await further developments of a program of study now seven years under way at the Institute of Forest Genetics of the United States Forest Service in cooperation with the University of California. Some of this work, however, has reached a point where publication is desirable, hence it is necessary that the pine be named. It will suffice here to report that several successful field crosses have been made and many of the F_1 hybrids are now growing in the nursery; the resin has been analyzed chemically and will be reported upon in due time. Precise statement of range must await the investigation of several recent reports of additional occurrences before it can be completely formulated. Hence the present paper will deal with the pine in the stand encompassing the type locality, which to date is the only stand positively known to exist by virtue of specimens in hand. As now understood the new pine is essentially confined to the lateral moraines about seven miles long and less than a mile wide flanking the upper reaches of Galena Creek and ranging in altitude from 7000 to 8500 feet. This precise habitat did not exist prior to the Pleistocene. Only a very few individuals occur off the moraines and these not more than a few hundred feet away. It is unfortunate that the stand today probably represents only